20020829 8259/001

FIG. 1
Prior Art

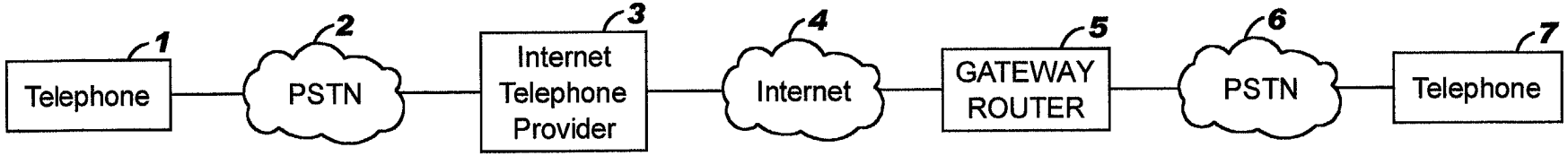

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FIG. 2
Prior Art

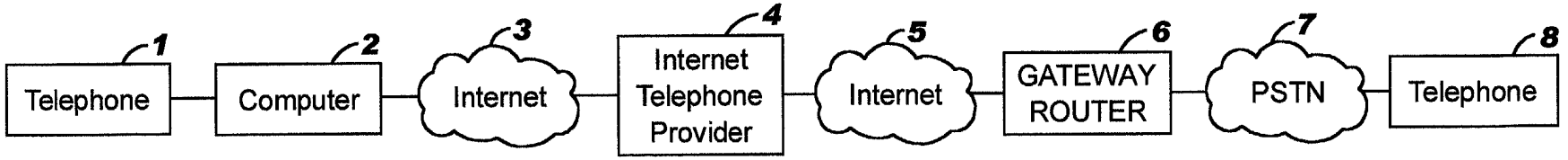

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FIG. 3

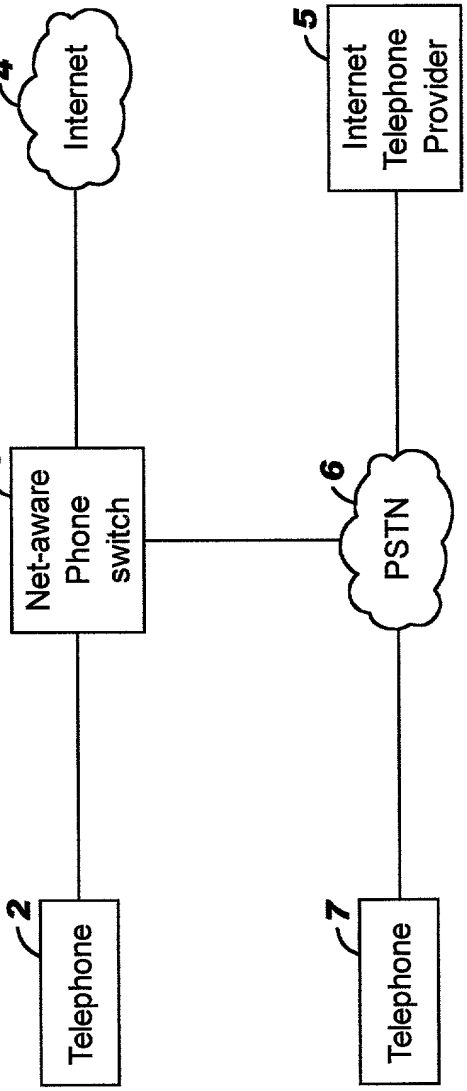

FIG. 4

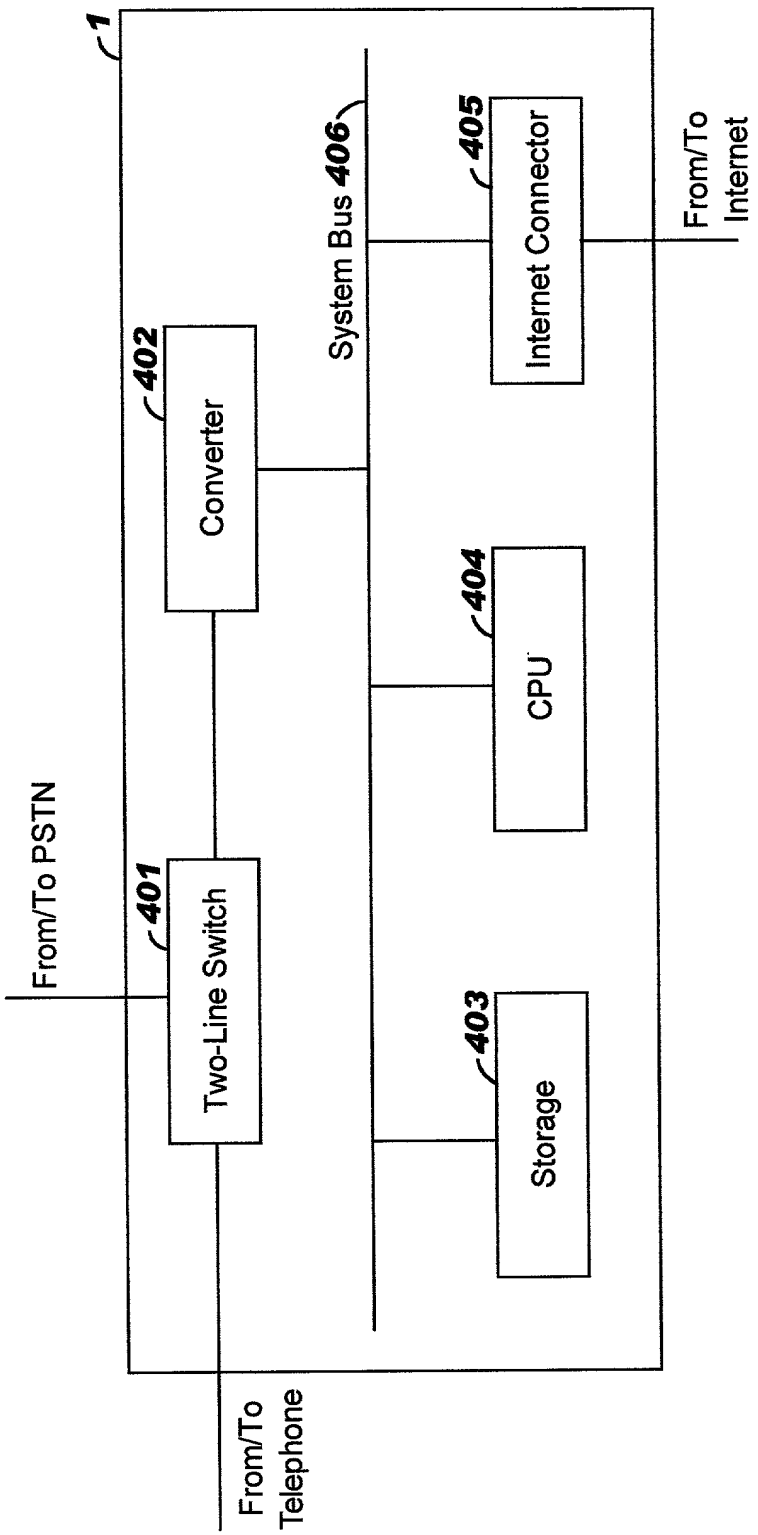
1
From/To PSTN
401
Two-Line Switch
From/To Telephone
402
Converter
System Bus 406
403
Storage
404
CPU
405
Internet Connector
From/To Internet

FIG. 5

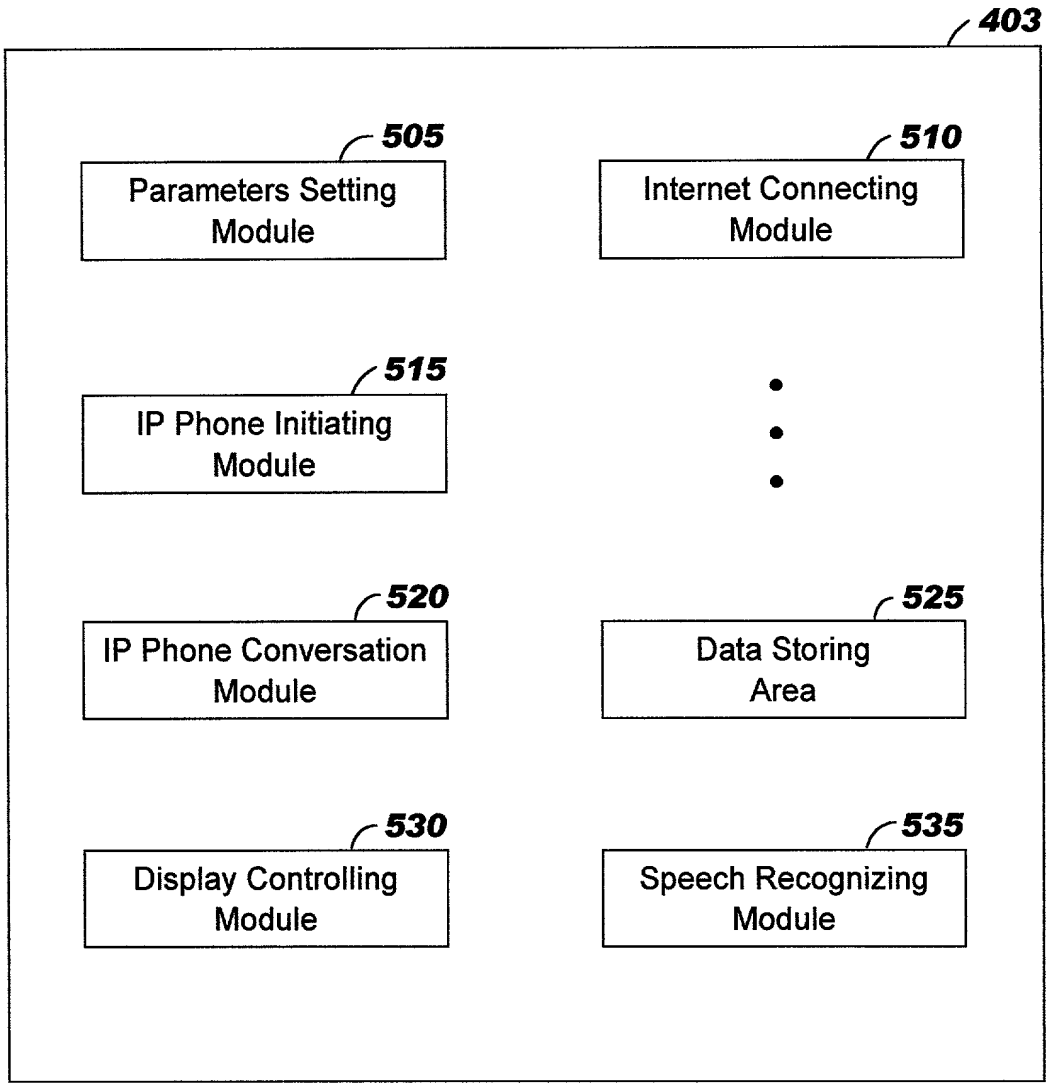
403
505
Parameters Setting Module
510
Internet Connecting Module
515
IP Phone Initiating Module
520
IP Phone Conversation Module
525
Data Storing Area
530
Display Controlling Module
535
Speech Recognizing Module

FIG. 6

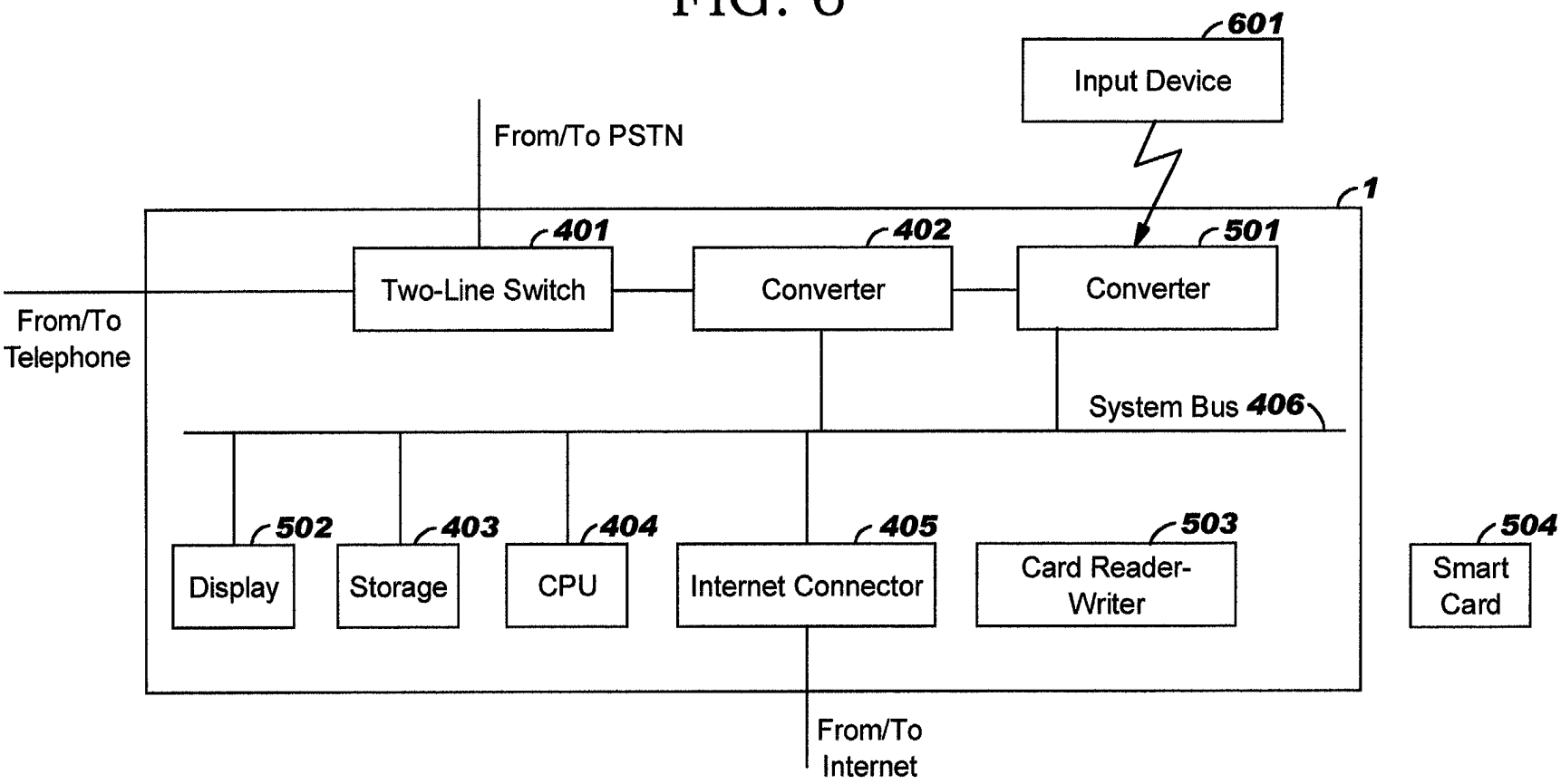

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FIG. 7

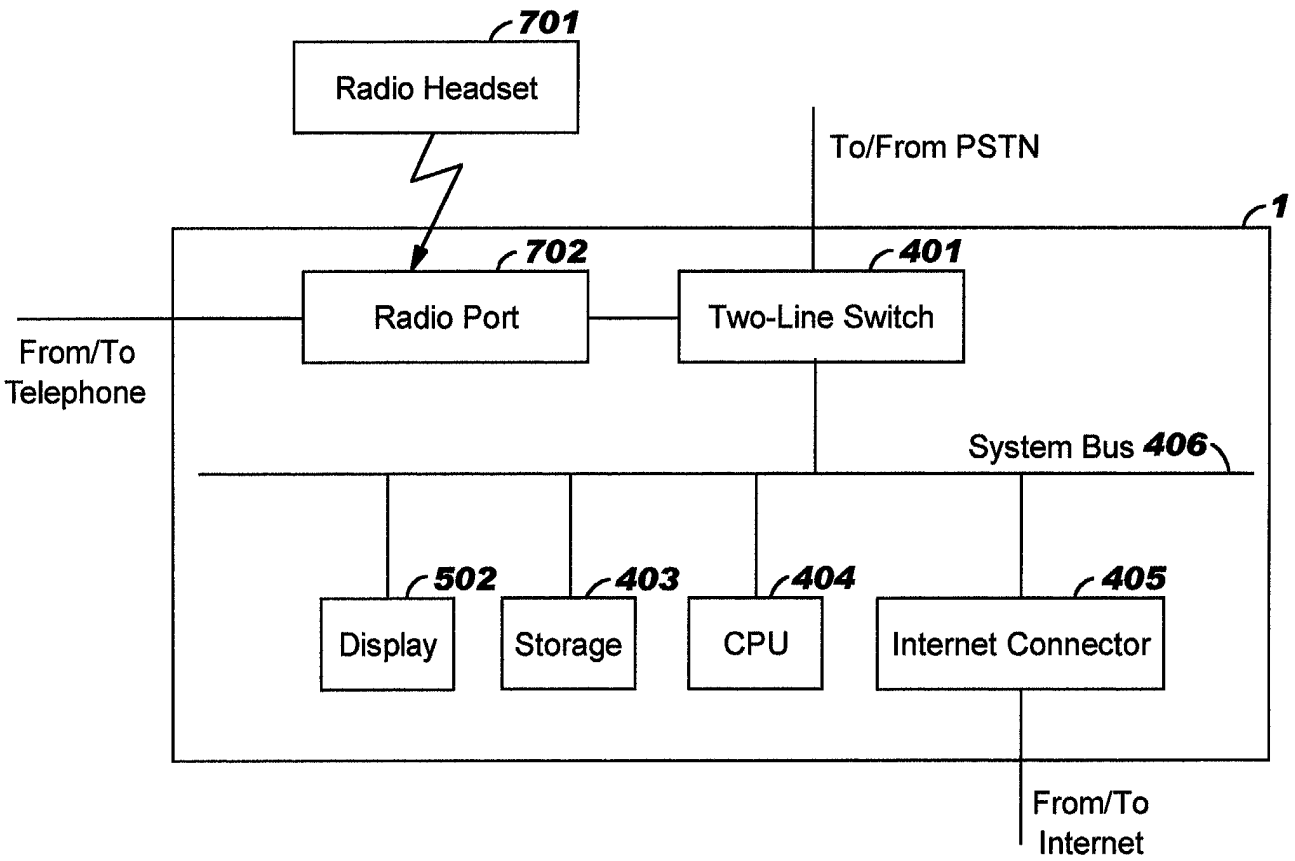

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FIG. 8A

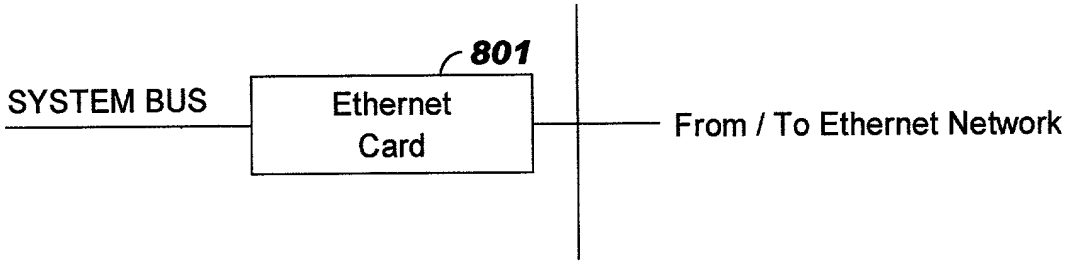


FIG. 8B

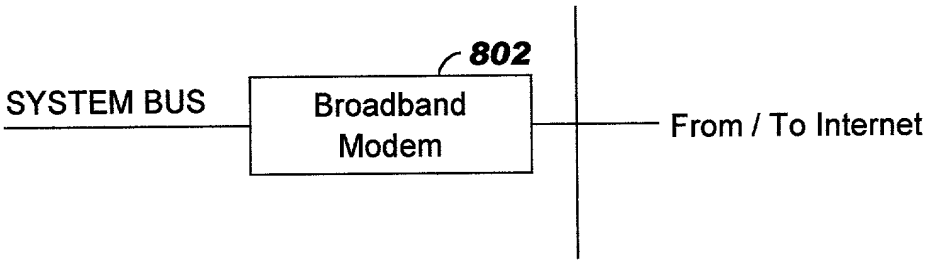


FIG. 8C

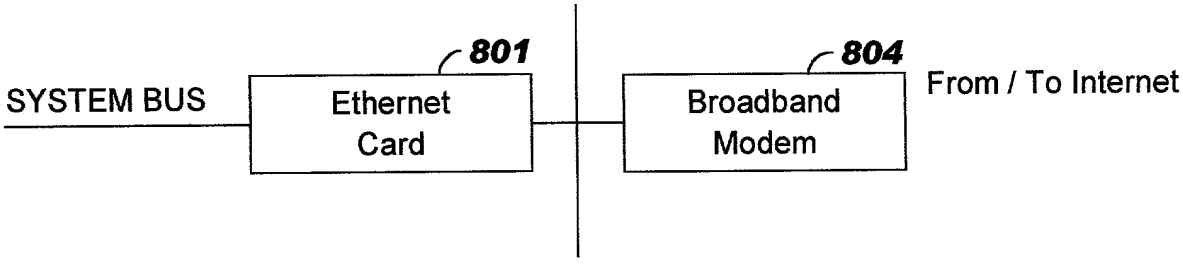


FIG. 9

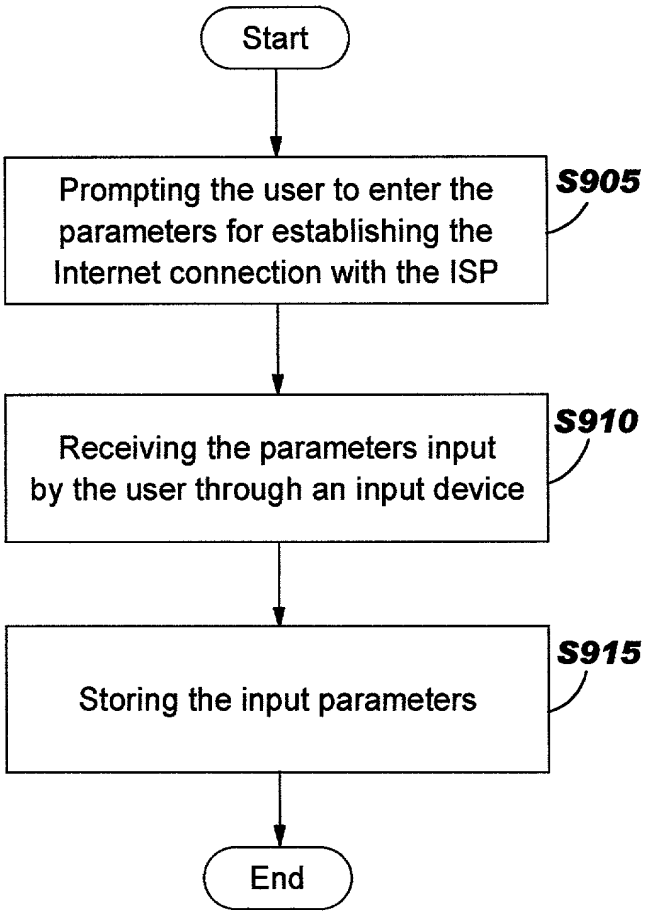

Start
Prompting the user to enter the parameters for establishing the Internet connection with the ISP
S905
Receiving the parameters input by the user through an input device
S910
Storing the input parameters
S915
End

FIG. 10

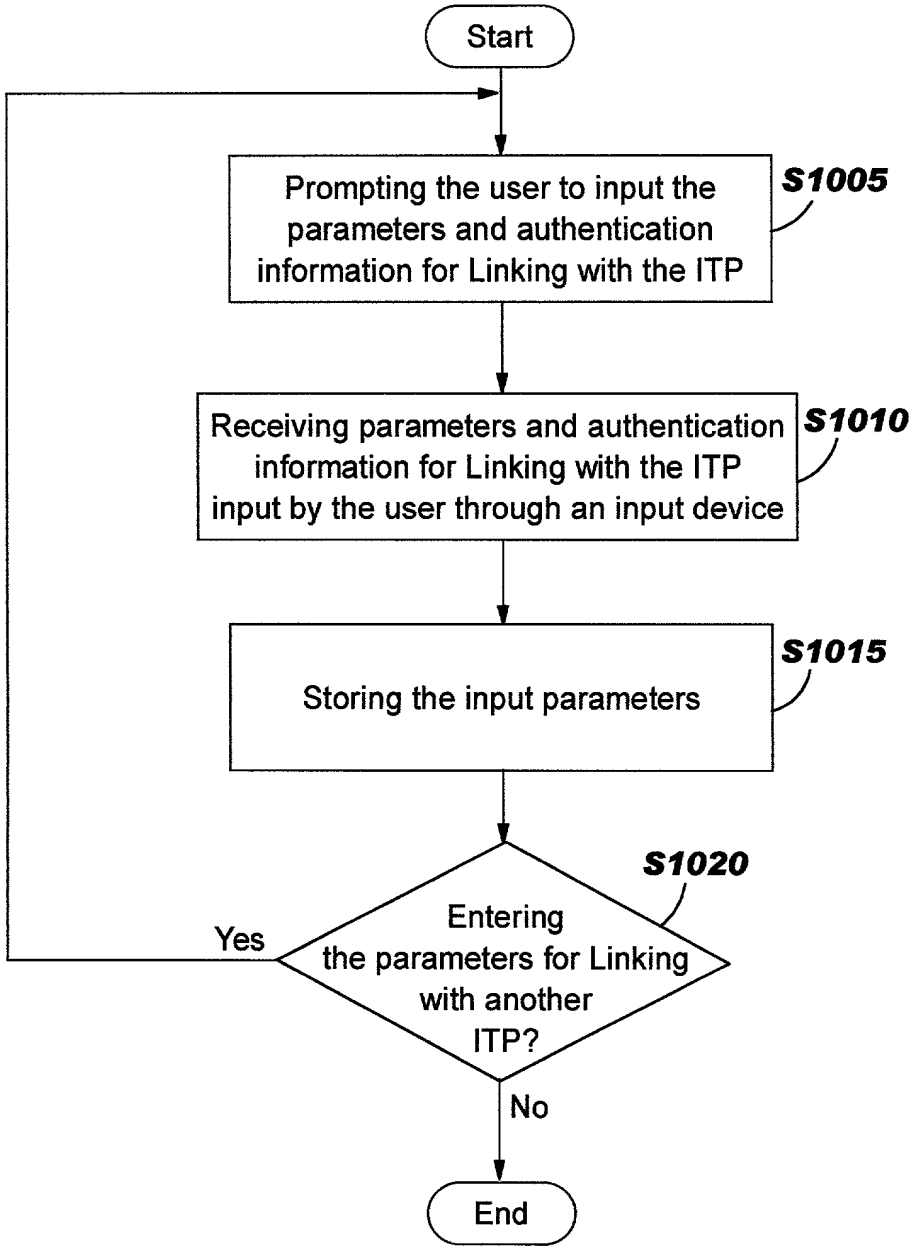
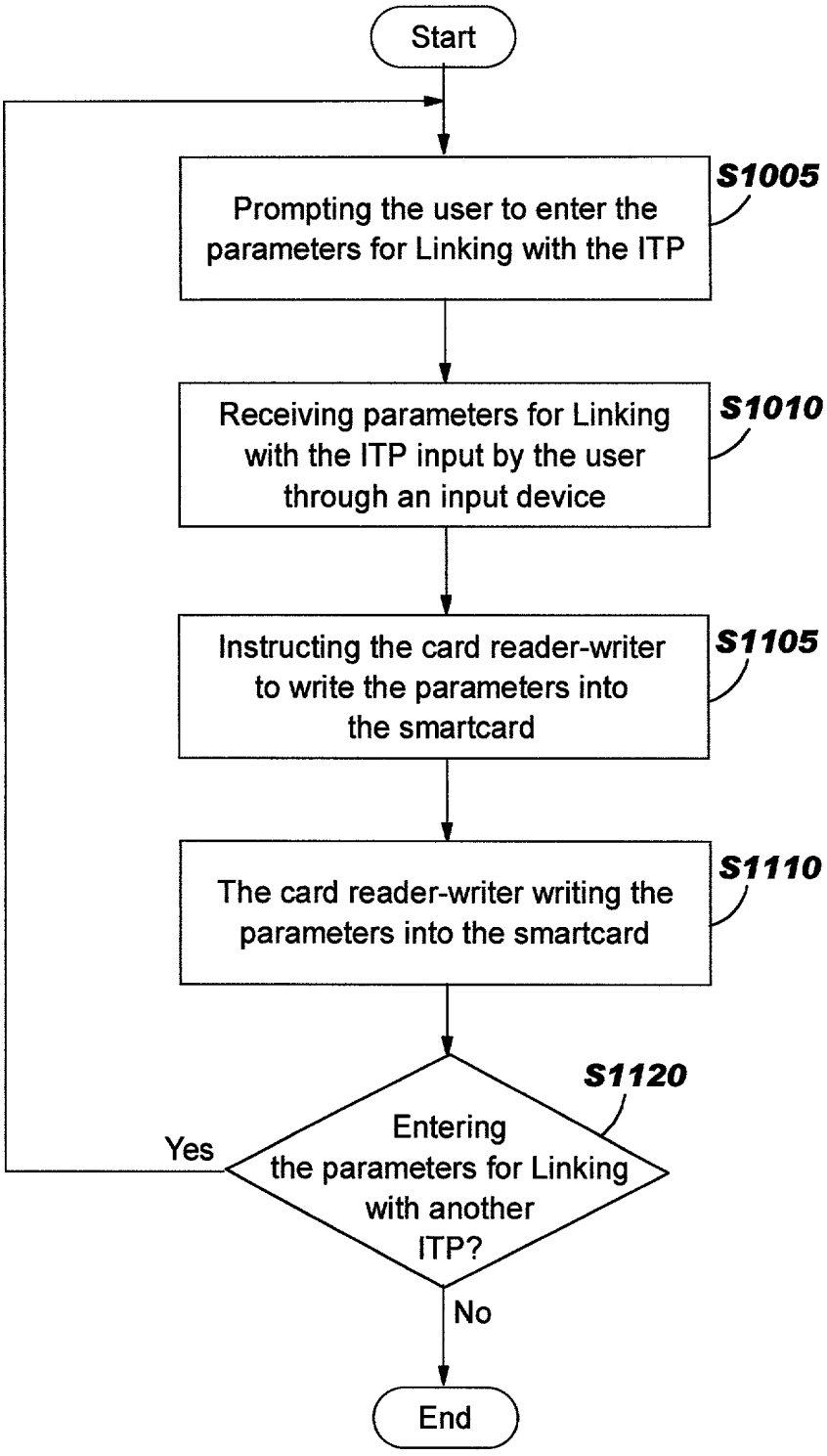

Start
Prompting the user to input the parameters and authentication information for Linking with the ITP
S1005
Receiving parameters and authentication information for Linking with the ITP input by the user through an input device
S1010
Storing the input parameters
S1015
Entering the parameters for Linking with another ITP?
S1020
Yes
No
End

FIG. 11



Appl. No. 09/975,208

FIG. 12

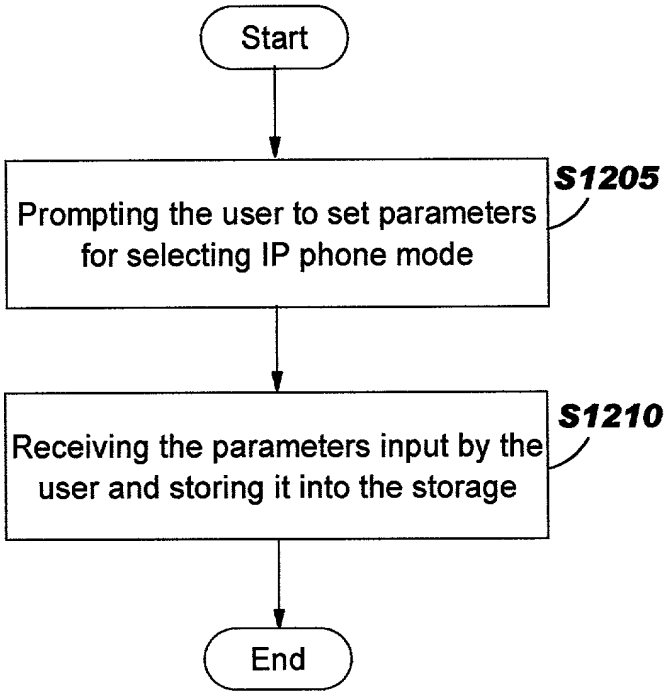

Start
Prompting the user to set parameters for selecting IP phone mode
S1205
Receiving the parameters input by the user and storing it into the storage
S1210
End

FIG. 13

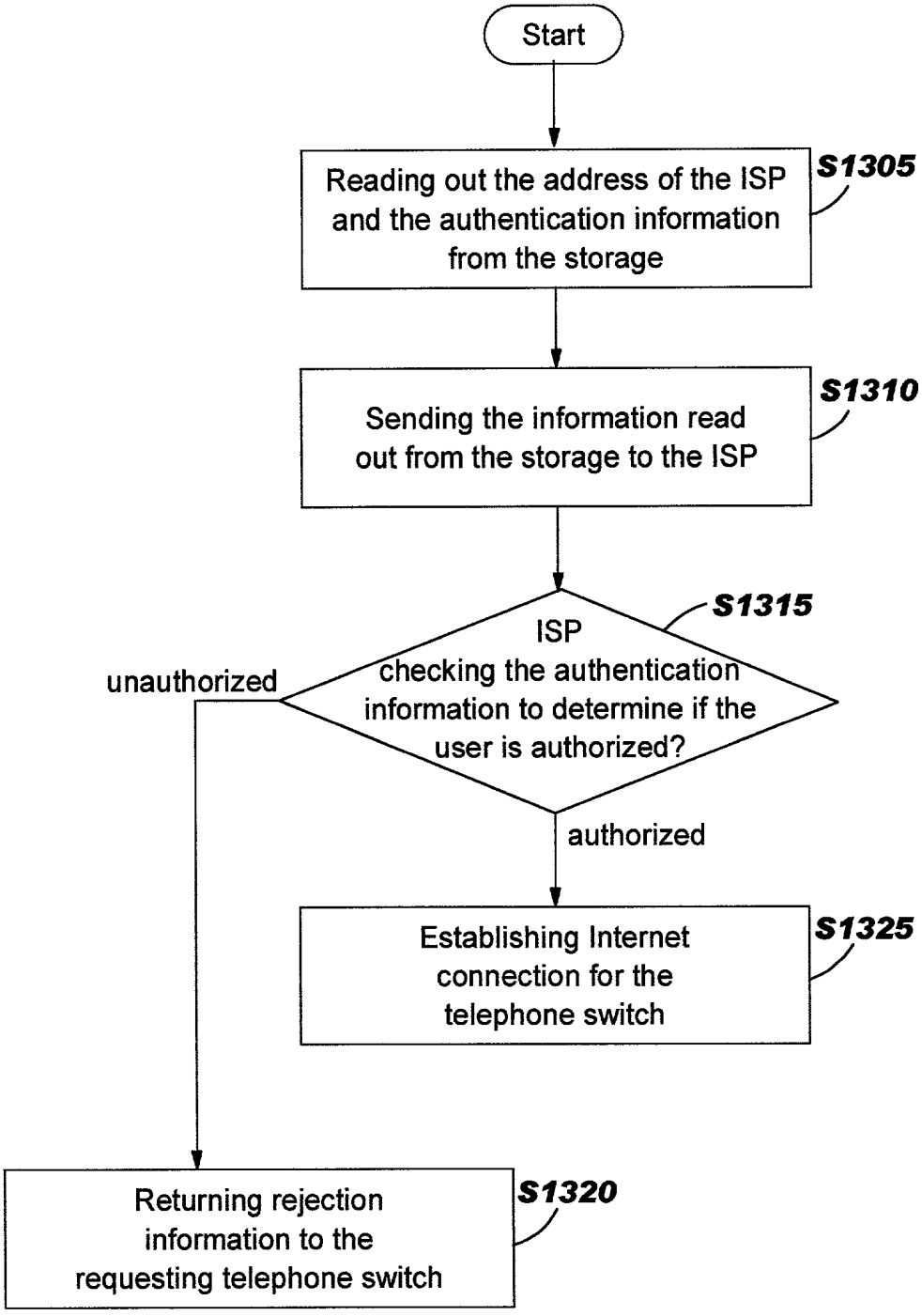

Start
Reading out the address of the ISP and the authentication information from the storage
S1305
Sending the information read out from the storage to the ISP
S1310
ISP checking the authentication information to determine if the user is authorized?
S1315
unauthorized
authorized
Establishing Internet connection for the telephone switch
S1325
Returning rejection information to the requesting telephone switch
S1320

FIG. 14A

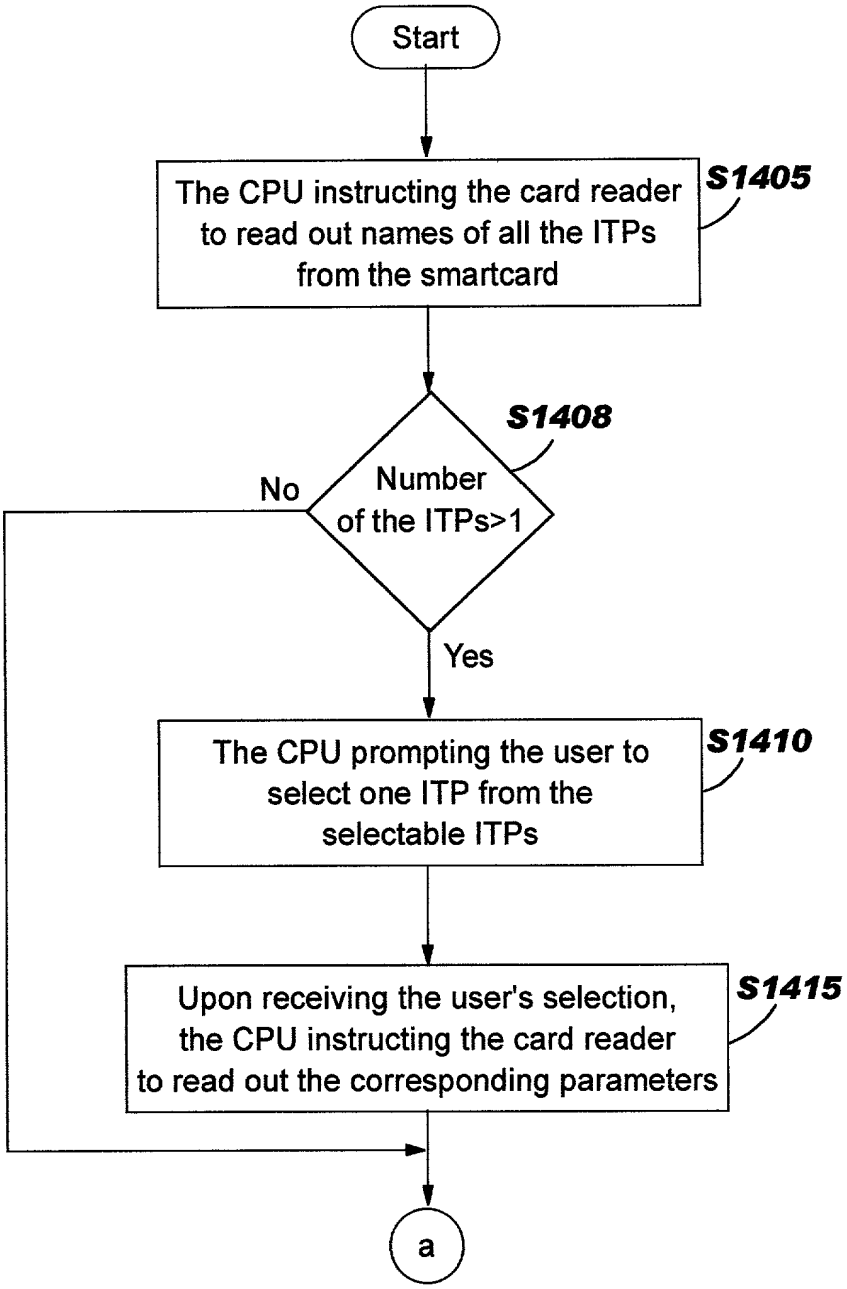

Start
The CPU instructing the card reader to read out names of all the ITPs from the smartcard
S1405
S1408
Number of the ITPs>1
No
Yes
The CPU prompting the user to select one ITP from the selectable ITPs
S1410
Upon receiving the user's selection, the CPU instructing the card reader to read out the corresponding parameters
S1415
a

FIG. 14B

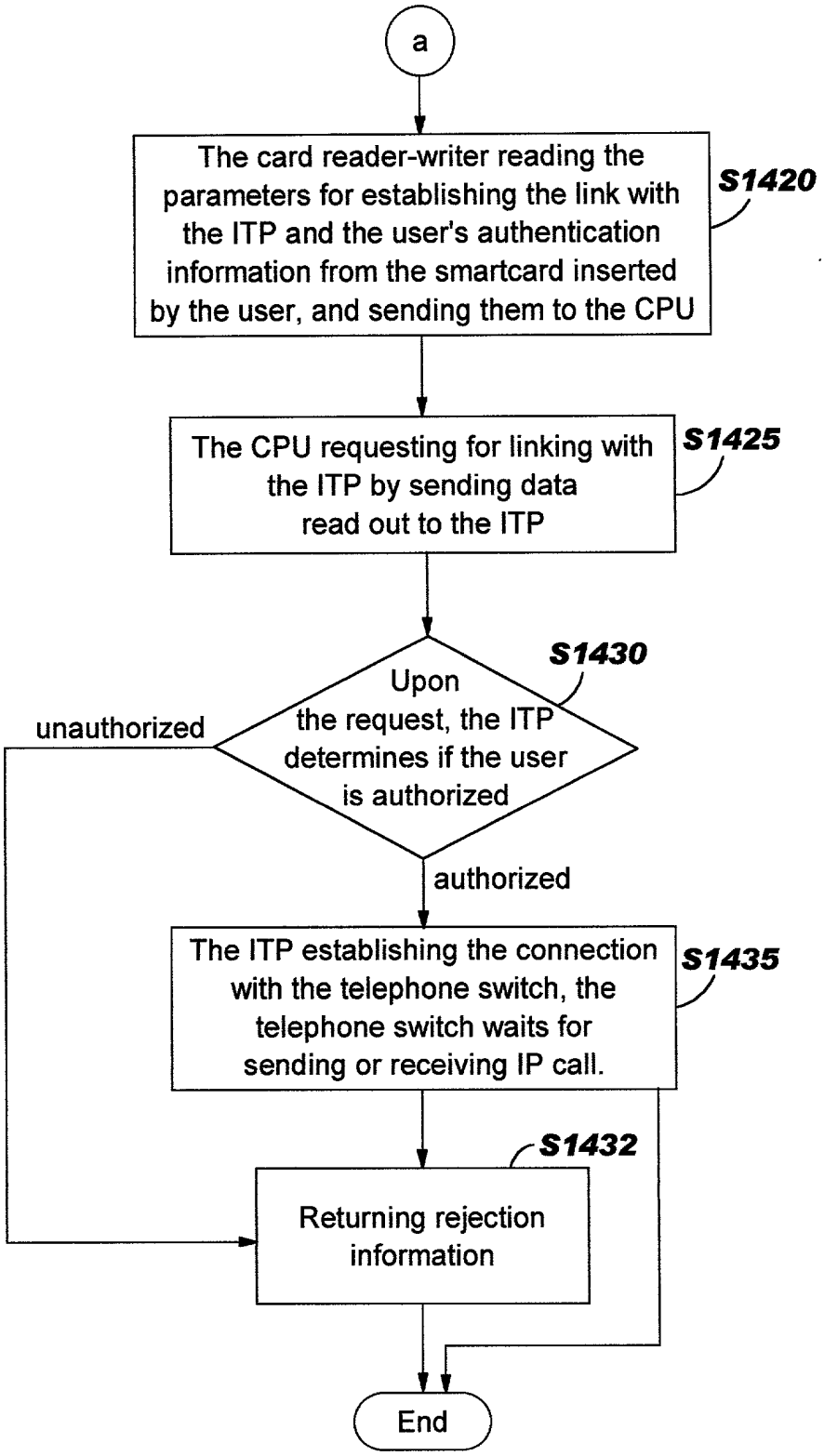

a
The card reader-writer reading the parameters for establishing the link with the ITP and the user's authentication information from the smartcard inserted by the user, and sending them to the CPU
S1420
The CPU requesting for linking with the ITP by sending data read out to the ITP
S1425
S1430
Upon the request, the ITP determines if the user is authorized
unauthorized
authorized
The ITP establishing the connection with the telephone switch, the telephone switch waits for sending or receiving IP call.
S1435
S1432
Returning rejection information
End

FIG. 15A

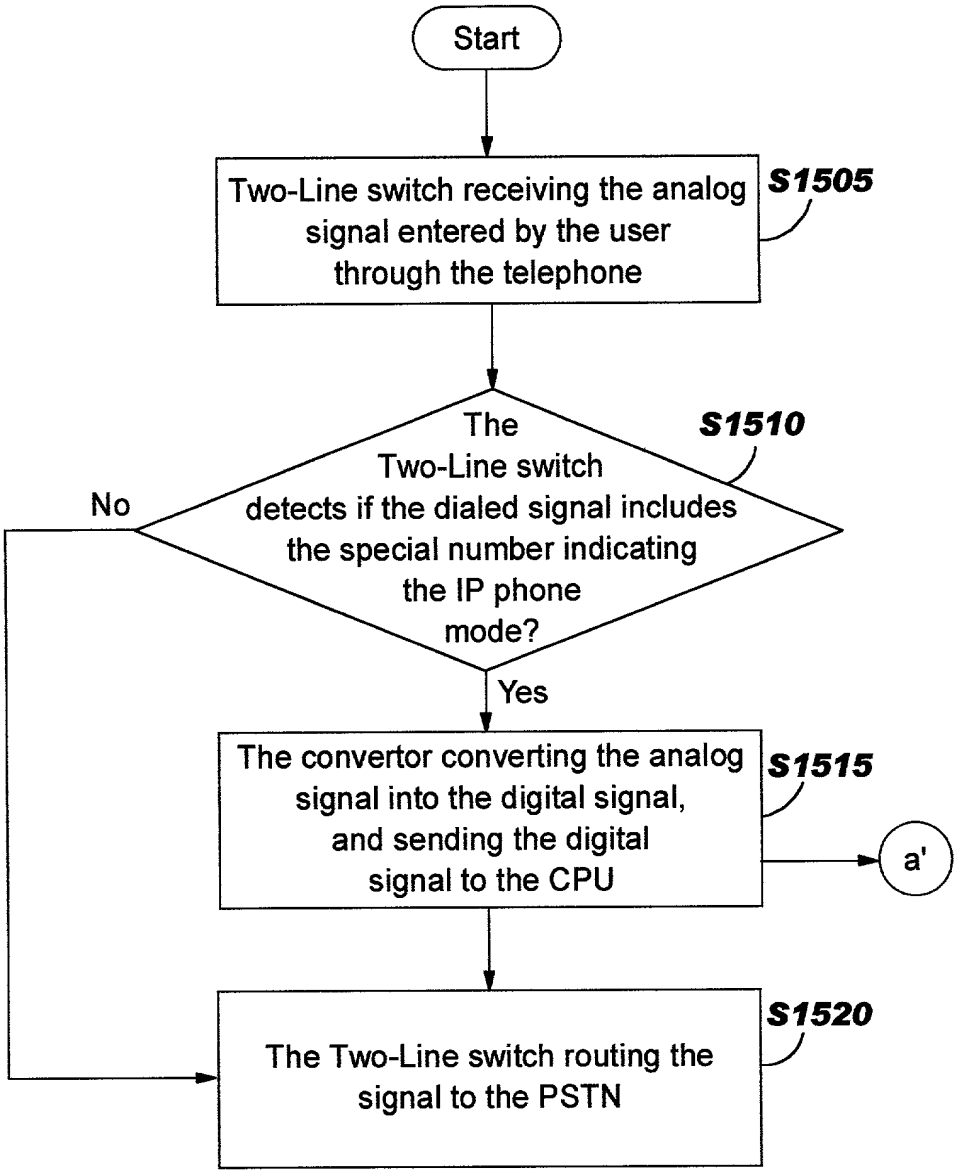

Start
Two-Line switch receiving the analog signal entered by the user through the telephone
S1505
The Two-Line switch detects if the dialed signal includes the special number indicating the IP phone mode?
S1510
No
Yes
The convertor converting the analog signal into the digital signal, and sending the digital signal to the CPU
S1515
a'
The Two-Line switch routing the signal to the PSTN
S1520

FIG. 15B

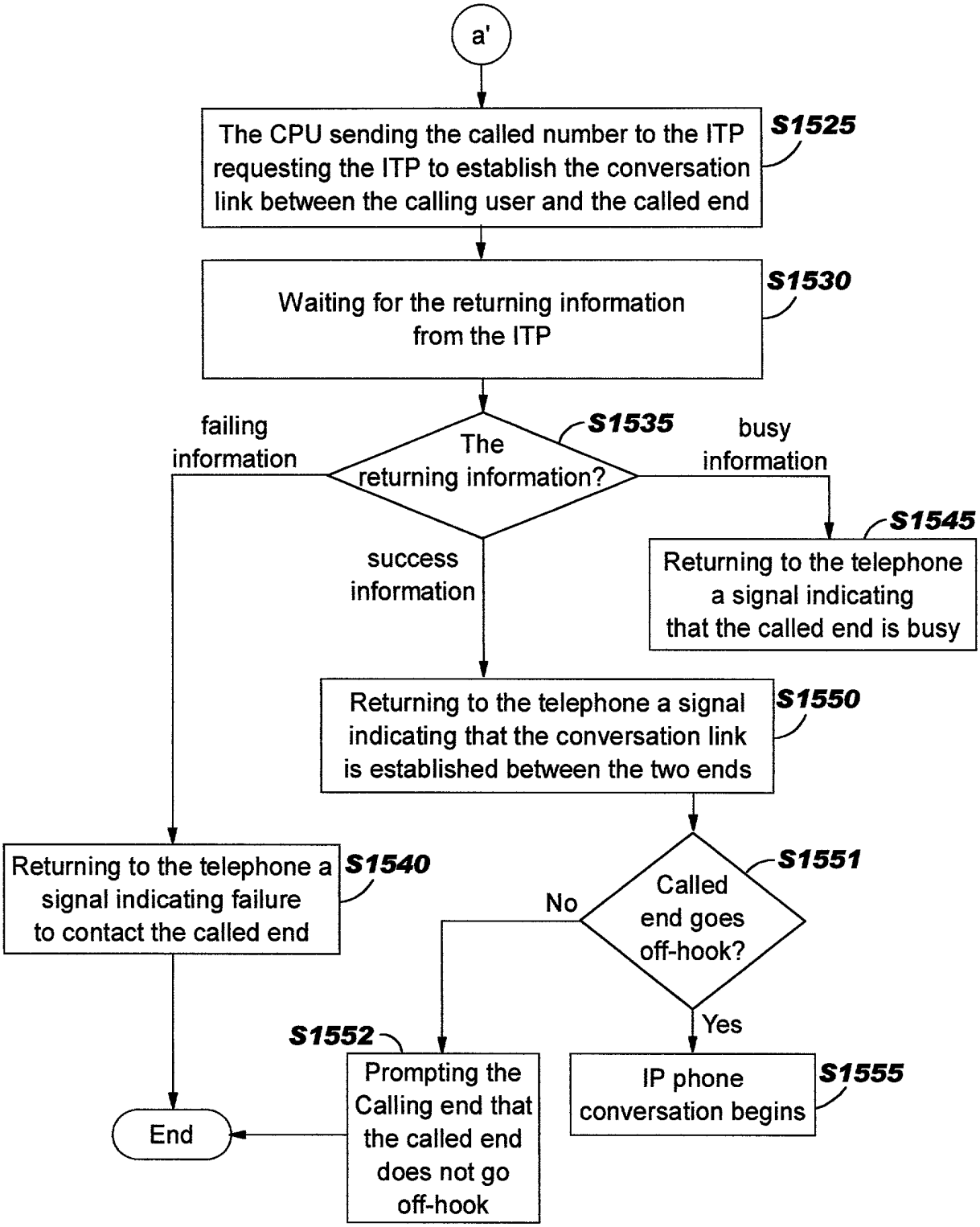

a'
The CPU sending the called number to the ITP requesting the ITP to establish the conversation link between the calling user and the called end
S1525
Waiting for the returning information from the ITP
S1530
The returning information?
S1535
failing information
busy information
success information
Returning to the telephone a signal indicating that the called end is busy
S1545
Returning to the telephone a signal indicating that the conversation link is established between the two ends
S1550
Returning to the telephone a signal indicating failure to contact the called end
S1540
Called end goes off-hook?
S1551
No
Yes
Prompting the Calling end that the called end does not go off-hook
S1552
IP phone conversation begins
S1555
End

FIG. 16

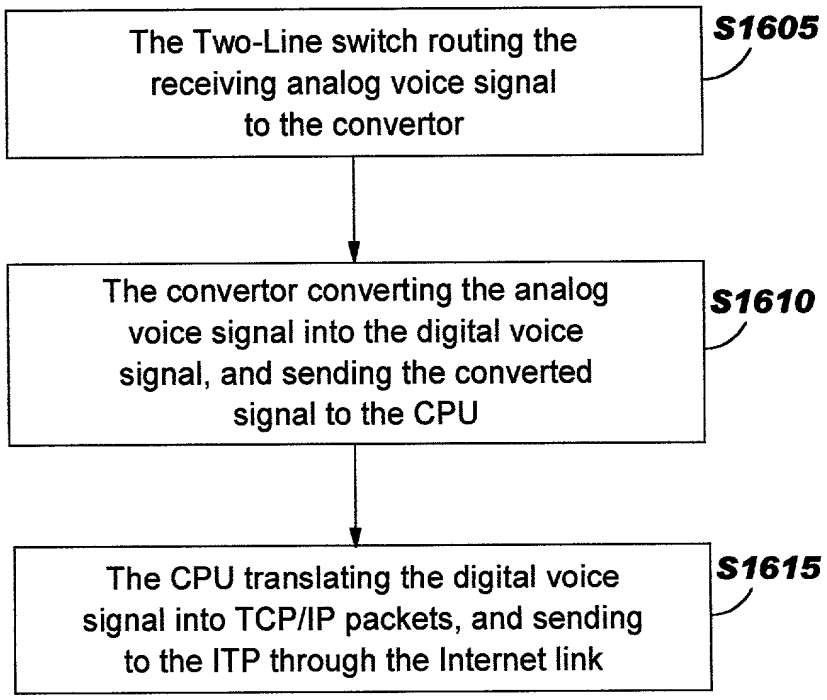
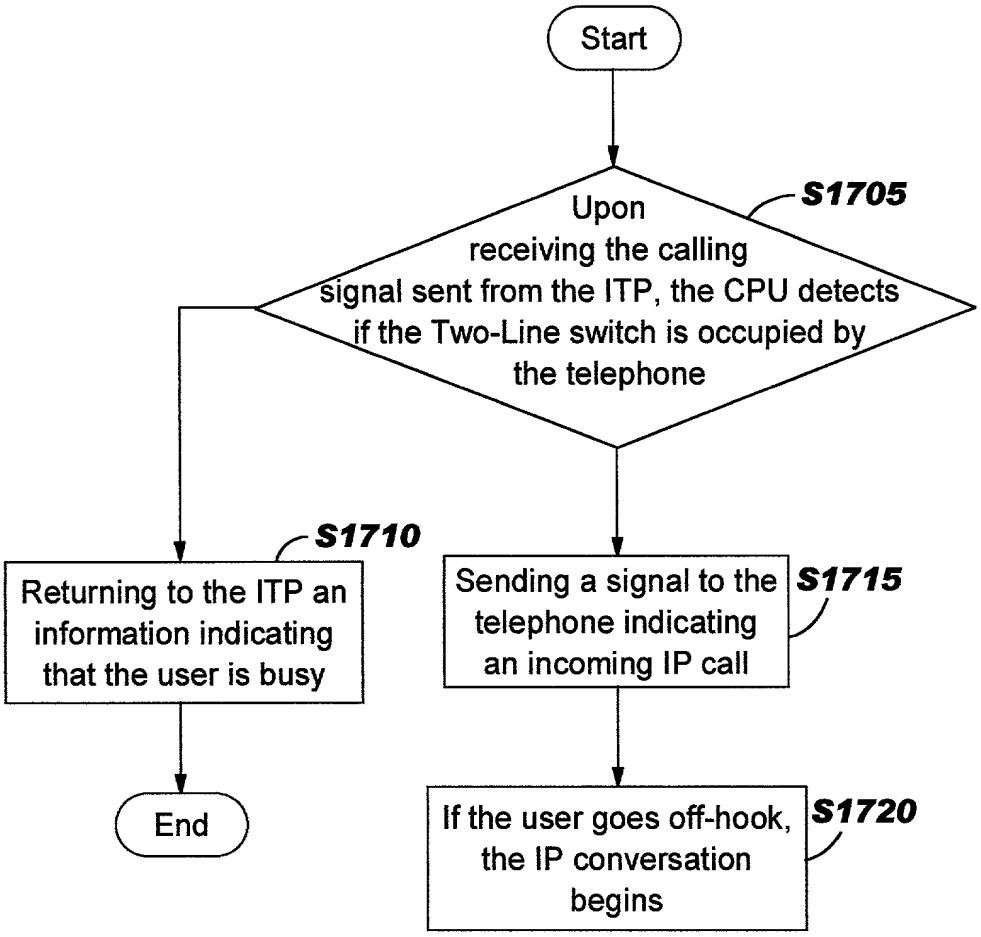

The Two-Line switch routing the receiving analog voice signal to the convertor
S1605
The convertor converting the analog voice signal into the digital voice signal, and sending the converted signal to the CPU
S1610
The CPU translating the digital voice signal into TCP/IP packets, and sending to the ITP through the Internet link
S1615

FIG. 17


Start
Upon receiving the calling signal sent from the ITP, the CPU detects if the Two-Line switch is occupied by the telephone
S1705
Returning to the ITP an information indicating that the user is busy
S1710
Sending a signal to the telephone indicating an incoming IP call
S1715
End
If the user goes off-hook, the IP conversation begins
S1720